



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southwest Fisheries Science Center
8604 La Jolla Shores Drive
La Jolla, CA 92037

12/17/2004

CRUISE INSTRUCTIONS

NOAA Ship: NOAA Ship *David Starr Jordan*

Cruise Number: DS-05-01

Cruise Dates: 18 January - 30 January, 2004

Cruise Title: CalCOFI northern extension.

Study Area: Point Conception to San Francisco out to 200 nautical miles.

Itinerary:

Ship loading and gear preparation: 12 - 14 JAN.

Transit: 18 JAN- Depart San Diego, CA 19 JAN-Station 73.3/100

Leg 1: 19 JAN - Station 73.3/100 26 JAN - Arrive Monterey, CA

Leg 2: 26 JAN - Station 63.3/52.0 30 JAN - Arrive San Francisco, CA

Tracklines and station positions are included at the end of this document in Appendix 1.

Sponsoring Institution: NOAA/NMFS, Southwest Fisheries Science Center (SWFSC)
Fisheries Resources Division (FRD)

Cruise Description and Objectives:

1. To conduct continuous underway sampling of surface waters. Temperature and salinity will be automatically logged by computer with the output from the GPS navigational unit.
2. To record current profiles throughout the duration of the cruise with the Acoustic Doppler Current Profiler.
3. To continue an ongoing assessment of pelagic fish stocks between La



Jolla and San Francisco, California.

4. To monitor environmental conditions within the CalCOFI survey area.
5. To make continuous observations of sea birds and marine mammals.
6. To record continuous acoustic targets obtained with the EK-500 scientific sounder.
7. To conduct sea trials of a new underway CTD designed and fabricated by researchers at SIO.

Chief Scientist: David A. Griffith, SWFSC (858) 546-7155, Dave.Griffith@noaa.gov

PLAN OF OPERATIONS

1.0 OPERATIONS

1.1 The *Jordan* will conduct operations in conjunction with the Scripps Institution of Oceanography research vessel *New Horizon*. During the southern occupation of the pattern (San Diego to Point Conception), the *New Horizon* will occupy the standard 66 CalCOFI stations from January 4 to January 20 and the *Jordan* will sample the northern region from Point Conception to San Francisco beginning January 18 and continuing until January 30 (see attached diagram).

1.1.1 Each standard CalCOFI station will include the following:

1.1.1.1 CTD/Rosette - consisting of 12 2-liter hydrographic bottles will be lowered to 500 meters (depth permitting) to measure physical parameters and collect water at discrete depths for analysis of: salinity, nutrients and chlorophyll..

1.1.1.2 CalBOBL (CalCOFI Bongo) - standard oblique plankton tow with 300 meters of wire out, depth permitting, using paired 505 μm mesh nets with 71 cm diameter openings. The technical requirements for this tow are: Descent wire rate of 50 meters per minute and an ascent wire rate of 20 meters per minute. All tows with ascending wire angles lower than 38° or higher than 51° in the final 100 meters of wire will be repeated. Additionally, a 45° wire angle should be closely maintained during the ascent and descent of the net frame.

1.1.1.3 Manta net (neuston) tow - using a 505 μm mesh net on a frame with a mouth area of 0.1333 m^2 . Tows are 15 minutes in duration at towing speed of approximately 1.5 - 2.0 knots. Wire angles should be kept between 15° and 25° .

1.1.1.4 Weather observations.

1.1.1.5 Pairovet net - will be fished from 70 meters to the surface (depth permitting) using paired 25 cm diameter 150 μm mesh nets out to and including

station 70. The technical requirements for Pairovet tows are: Descent rate of 70 meters per minute, a terminal depth time of 10 seconds and an ascent rate of 70 meters per minute. All tows with wire angles exceeding 15° during the ascent will be repeated.

1.1.2 Test Underway CTD profiler – during the first week of the cruise, an underway CTD (UCTD) profiler will be tested during daylight hours. The system is self-contained, using a small (110-volt) electric fishing reel. The testing times will be determined by the Cruise Leader and/or ship command, so as not to interfere with the primary objective of the survey. The UCTD will be deployed several times per day during daylight hours. It should not require much, if any, slowing of the ship. To verify that the UCTD is working properly, the UCTD will be cast concurrently with the SBE 9 while on station. The estimated cast time is no longer than 30 minutes. This operation may require assistance from the deck department, which will be requested in advance by the Cruise Leader.

1.1.3 Thermosalinometer Sampling - The ship will provide and maintain a thermosalinometer (TSG), which is calibrated and in working order, for continuous measurement of surface water temperature and salinity. A backup unit (calibrated and in working order) will also be provided by the vessel and remain aboard during the cruise. The Scientific Computing System (SCS) will serve as the main data collection system.. All SCS data will be provided to SWFSC personnel at the completion of the cruise.

1.1.4 Acoustics –The scientific EK-60 depth sounder will be operated, at 38, 120 and 200 KHz and interfaced to a data acquisition system to estimate micronekton biomass between 0 and 500 m. The vessel's EQ-50 depth sounder may be used at the discretion of the Commanding Officer, but will normally remain off while underway. The ship shall inform the Cruise Leader of any use of the vessel's EQ-50, as it interferes with the signals received on the scientific EK-60. Its use will be continuous.

1.1.5 ADCP – The ship's ADCP should run continuously and be logged to a data acquisition system. Complete system settings will be provided by the oceanographer, but will include 5-minute averaging of currents, AGC and 4 beam returns in 60 8-meter bins.

2.0 SCIENTIFIC PERSONNEL

2.1 Chief Scientist - The Chief Scientist is David A. Griffith, SWFSC, at phone (858) 546-7155.

The Chief Scientist is authorized to alter the scientific portion of this cruise plan with the concurrence of the Commanding Officer, provided that the proposed changes will not: (1) jeopardize the safety of personnel or the ship, (2) exceed the time allotted for the cruise, (3) result in undue additional expense, or (4) change the general intent of the project.

2.2 Participating Scientists

Please see Appendix 3.

2.3 Medical Forms - All scientific personnel will complete a NOAA Health Services Questionnaire (NHSQ) prior to embarking, as per NC Instruction 6000. This form will be routed through MOP Health Services for approval 30 days prior to the cruise.

3.0 EQUIPMENT

3.1 Supplied by scientific party:

1. -80°C Freezer (SWFSC)
2. 37% Formalin (SWFSC)
3. Ethanol (SWFSC)
4. Tris buffer (SWFSC)
5. Sodium borate (SWFSC)
6. 30 cc and 50 cc syringes (SWFSC)
7. Canulas (SWFSC)
8. Pint, quart and gallon jars (SWFSC)
9. Inside and outside labels (SWFSC)
10. CalCOFI net tow data sheets (SWFSC)
11. 71 cm CalCOFI Bongo frames (SWFSC)
12. 71 cm CalCOFI 505 µm mesh nets (SWFSC)
13. CalCOFI 150 µm Calvet nets and codends (SWFSC)
14. CalCOFI Pairovet frames (SWFSC)
15. 333 µm mesh codends (SWFSC)
16. Inclinator for bongo tows (SWFSC)
17. Digital flowmeters (SWFSC)
18. 75 lb Bongo weight (SWFSC)
19. 100 lb hydro weights (SWFSC)
20. CalCOFI Manta net frames (SWFSC)
21. 60 cm CalCOFI 505 µm mesh Manta nets (SWFSC)
22. Standard CalCOFI tool boxes (SWFSC)
23. Bucket thermometers and holders (SWFSC)
24. Hand held inclinometer for Pairovet tows (SWFSC)
25. Guideline Portasal (SWFSC)
26. Underway CTD (SWFSC)
27. Mounting/launching platform for underway CTD (SWFSC)
28. XBT probes (2 boxes) (SWFSC)
29. Salinity bottles (SWFSC)
30. Standard sea water (SWFSC)
31. Data sheets for scheduled hydrographic work (SIO)
32. Weather observation sheets (SIO)
33. CTD and rosette (SWFSC)
34. 2 liter hydrographic bottles (SWFSC)
35. Turner fluorometer (MBARI)

36. Nutrient vials (MBARI)
37. EK-60 Scientific sounder (SWFSC)

3.2 Supplied by ship - We request the following systems and their associated support services, sufficient consumables, back-up units, and on-site spares. All measurement instruments are assumed to have current calibrations and we request that all pertinent calibration information be included in the data package.

1. Starboard hydro winch with 1/4" cable for standard Bongo, Paironet and Manta tows
2. Port winch with .322" conductive cable
3. J-frame w/block to accommodate .322" cable
4. Constant temperature room set at $22^{\circ}\text{C} \pm 1^{\circ}\text{C}$ ($71.5^{\circ}\text{F} \pm 2^{\circ}\text{F}$)
5. Winch monitoring system
6. Seabird thermosalinometer
7. Knudsen 12 kHz depth recorder
8. Acoustic Doppler Current Profiler w/writeable CD drive

3.3 Installation and Maintenance - Prior to departure from San Diego the Chief Scientist and members of the scientific party may board the vessel, with permission of the Commanding Officer, to test survey equipment and environmental sensors. It is also requested that the constant temperature room be set at $22^{\circ}\text{C} \pm 1^{\circ}\text{C}$ ($71.5^{\circ}\text{F} \pm 2^{\circ}\text{F}$) prior to departure.

3.4 Hazardous Materials - The Chief Scientist shall be responsible for complying with NC Instruction 6280a, Hazardous Materials and Hazardous Waste; policy, guidance, and training, dated February 4, 1991, paragraph 7.g and paragraph 9. By Federal Law, the ship may not sail without a complete inventory of Material Safety Data Sheets (MSDS's) and appropriating neutralizing agents, buffers, and/or absorbents in amounts adequate to address spills of a size equal to the amount of chemicals brought on board. The Chief Scientist will provide the Commanding Officer with a copy of all MSDS's prior to the cruise.

4.0 DATA RESPONSIBILITIES

4.1 Collection of Data - The Chief Scientist will receive all original data related to the project. The Chief Scientist will in turn furnish the Commanding Officer with a complete inventory listing of all data gathered by the scientific party, detailing types of operations and quantities of data prior to departing the ship. All data gathered by the vessel's personnel that are desired by the Chief Scientist will be released to her, including supplementary data specimens and photos gathered by the scientific crew.

4.2 Dissemination of Data - The Chief Scientist is responsible for the quality assurance, disposition and archiving of data and specimens collected aboard the ship. The Chief Scientist is also responsible for the dissemination of copies of these data to cruise participants and to any other requesters. The SWFSC cruise report will be submitted

according to SWFSC procedures to appropriate persons and groups.

4.3 Evaluation Form - The Chief Scientist will complete the Ship Operations Evaluation Form and forward it to the Office of Marine and Aviation Operations. The Commanding Officer will provide this form.

5.0 ADDITIONAL INVESTIGATIONS AND PROJECTS

5.1 Ancillary Projects - Ancillary projects are secondary to the objectives of the cruise, should be treated as additional investigations, do not have representation aboard, and are accomplished by the ship's force. Ancillary tasks will be accomplished in accordance with the NOAA Fleet Standing Ancillary Instructions. Any additional work will be conducted so as not to interfere with operations as outlined in these instructions. The Chief Scientist will be responsible for determining the priority of additional work relative to the primary project with approval from the Commanding Officer.

6.0 COMMUNICATIONS

6.1 Radios - The Cruise Leader or designee may request, from the Commanding Officer, the use of radio transceivers aboard the ship to communicate with other vessels and aircraft, if necessary.

6.2 Telephone - The Cruise Leader or designee may require access to the ship's INMARSAT or cellular telephone systems with permission from the Commanding Officer. The Commanding Officer will provide the Cruise Leader with a log of all INMARSAT calls made from the ship for SWFSC business at the end of each leg. In accordance with the Communications Reimbursement Policy, SWFSC will pay these charges via a transfer of funds from SWFSC to the ship.

6.3 Electronic Mail - All members of the scientific party will have access to e-mail for communications with persons not aboard the ship. The amount of such communication traffic will be determined by the Chief Scientist.

6.4 Routine Reports - The Cruise Leader will submit a weekly cruise report, along with time and attendance for the scientific party, to the Survey Coordinator each Thursday during the cruise via e-mail or, if e-mail is not functioning properly, via fax. Richard Charter at SWFSC will be on the distribution list for the ship's noon position reports.

7.0 MISCELLANEOUS

7.1 Pre-cruise Meeting - A pre-cruise meeting between the Chief Scientist and the Commanding Officer (and his staff) will be held prior to the start of the cruise to identify operational requirements (i.e., overtime, modifications, repairs or procurement). The date and time for this meeting is yet to be scheduled.

7.2 Underway Meetings - Meetings between the Commanding Officer (and other officers) and the Cruise Leader should occur at the beginning and end of each leg to discuss and solve any problems or changes that may arise. Additional meetings should occur as needed.

7.3 Debrief - A post-cruise debriefing will be held between the Chief Scientist and the Commanding Officer. If serious problems are identified, the Commanding Officer shall notify the Marine Operations Center, Pacific, in the most direct means available. The Chief Scientist shall document identified problems in the Ship Operations Evaluation Form. The time and date for the debrief will be determined toward the end of the cruise.

7.4 Time and Attendance - Time and Attendance will be filled out by the SWFSC timekeeper while the ship is at sea, based on information transmitted by the Cruise Leader to the Survey Coordinator. Scheduled overtime is authorized for Saturdays, Sundays, holidays and any hours over a standard eight hour week day. Irregular overtime will be authorized by the Cruise Leader as required. SWFSC personnel are authorized per diem at the rate of \$3.00 per day to be paid via a travel voucher at the termination of the cruise. Task Number C8LSEDH-P15 will pay for per diem and overtime for any SWFSC permanent, term or temporary employees.

Time and Attendance for Aquatic Farms contract employees will be based upon a predetermined schedule. If events of the cruise alter the planned schedule, the Cruise Leader will notify the Survey Coordinator, and appropriate changes will be brought to the attention of Aquatic Farms.

7.5 Navigation - Primary control will be GPS, also dead reckoning based on visual bearings and radar ranges when possible.

7.6 Scientific Spaces - The Cruise Leader shall be responsible for the proper upkeep and cleaning of all spaces assigned to the scientific party, both laboratory and living spaces, throughout the cruise. The Cruise Leader or Chief Scientist will make berthing assignments for scientific personnel on a per-leg basis, with approval of the Commanding Officer.

For further information contact Richard Charter, Southwest Fisheries Science Center, National Marine Fisheries Service, NOAA, 8604 La Jolla Shores Drive, La Jolla, CA 92037; Richard.Charter@noaa.gov, Phone (858) 546-7157. More information about the cruise and project can be found at the project's website:
<http://swfsc.nmfs.noaa.gov/frd/CalCOFI/CC1.htm>

Prepared by: _____
David Griffith
Chief Scientist, SWFSC

Date: _____

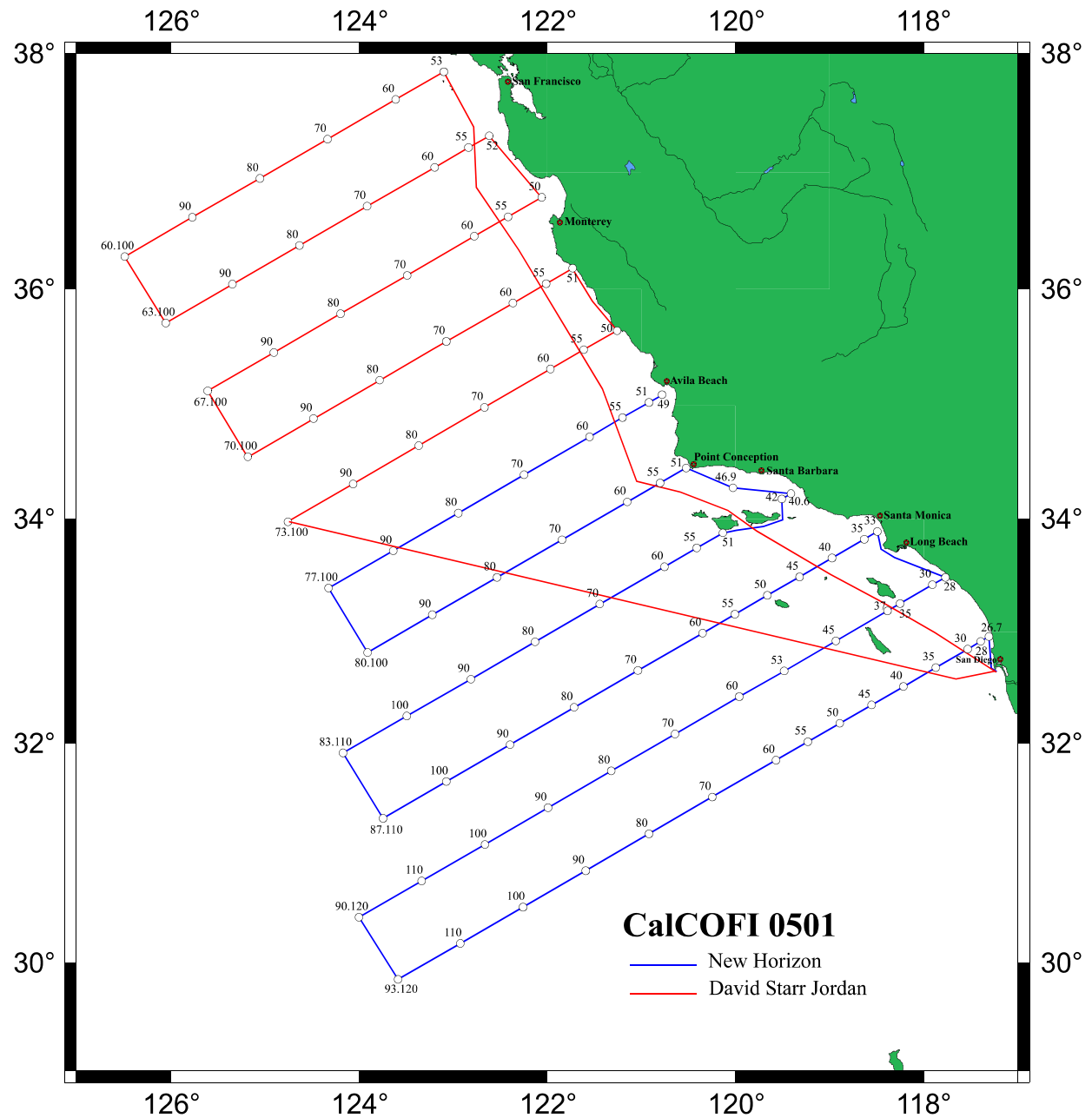
Approved by: _____
William W. Fox, PhD.
Science & Research Director
Southwest Region

Date: _____

Approved by: _____
CAPT John C. Clary
Director
NOAA Marine Operations Center - Pacific

Date: _____

Appendix 1. NOAA Ship *David Starr Jordan* track lines for CalCOFI 0501JD



Appendix 2. Station positions:

| | Line | Station | Dlatitude | Dlongitude |
|----|--------|---------|-------------|-------------------------|
| 1 | 94.722 | 27.987 | 32.667 | 117.2329967 (San Diego) |
| 2 | 73.3 | 100 | 33.97714071 | 124.7558979 |
| 3 | 73.3 | 90 | 34.31047404 | 124.0615369 |
| 4 | 73.3 | 80 | 34.64380737 | 123.3643879 |
| 5 | 73.3 | 70 | 34.97714071 | 122.6644048 |
| 6 | 73.3 | 60 | 35.31047404 | 121.9615407 |
| 7 | 73.3 | 55 | 35.47714071 | 121.6090134 |
| 8 | 73.3 | 50 | 35.64380737 | 121.2557479 |
| 9 | 70 | 51 | 36.18205081 | 121.7258644 |
| 10 | 70 | 55 | 36.04871747 | 122.0104783 |
| 11 | 70 | 60 | 35.88205081 | 122.3655627 |
| 12 | 70 | 70 | 35.54871747 | 123.0734784 |
| 13 | 70 | 80 | 35.21538414 | 123.7784308 |
| 14 | 70 | 90 | 34.88205081 | 124.4804682 |
| 15 | 70 | 100 | 34.54871747 | 125.1796381 |
| 16 | 66.7 | 100 | 35.12029424 | 125.6068938 |
| 17 | 66.7 | 95 | 35.28696091 | 125.2552015 |
| 18 | 66.7 | 90 | 35.45362757 | 124.9027779 |
| 19 | 66.7 | 85 | 35.62029424 | 124.5496169 |
| 20 | 66.7 | 80 | 35.78696091 | 124.1957124 |
| 21 | 66.7 | 75 | 35.95362757 | 123.8410585 |
| 22 | 66.7 | 70 | 36.12029424 | 123.4856487 |
| 23 | 66.7 | 65 | 36.28696091 | 123.1294771 |
| 24 | 66.7 | 60 | 36.45362757 | 122.7725371 |
| 25 | 66.7 | 55 | 36.62029424 | 122.4148226 |
| 26 | 66.7 | 50 | 36.78696091 | 122.0563271 |
| 27 | 63.3 | 52 | 37.30919152 | 122.6178311 |
| 28 | 63.3 | 55 | 37.20919152 | 122.8345184 |
| 29 | 63.3 | 60 | 37.04252485 | 123.1950214 |
| 30 | 63.3 | 70 | 36.70919152 | 123.9136417 |
| 31 | 63.3 | 80 | 36.37585818 | 124.6291242 |
| 32 | 63.3 | 90 | 36.04252485 | 125.3415203 |
| 33 | 63.3 | 100 | 35.70919152 | 126.05088 |
| 34 | 60 | 100 | 36.28076828 | 126.4855862 |
| 35 | 60 | 90 | 36.61410162 | 125.7709893 |
| 36 | 60 | 80 | 36.94743495 | 125.0532694 |
| 37 | 60 | 70 | 37.28076828 | 124.3323747 |
| 38 | 60 | 60 | 37.61410162 | 123.6082525 |
| 39 | 60 | 53 | 37.84743495 | 123.099418 |
| 40 | 80 | 53 | 34.38333333 | 120.6632324 |

Arrive San Francisco

Appendix 3. Personnel for the CalCOFI 0501 Survey

David Starr Jordan Leg I:

| Position | Name | Affiliation | Berth |
|-------------------|---------------------|-------------|-------|
| Chief Scientist | Dave Griffith | SWFSC | |
| Fishery Biologist | Ron Dotson | SWFSC | |
| Fishery Biologist | Dimitry Abramenkoff | SWFSC | |
| Biologist | Noelle Bowlin | AF | |
| Oceanographer | Valerie Andreassi | SWFSC | |
| Oceanographer | Paul Fiedler | SWFSC | |
| Oceanographer | Melinda Kelley | SWFSC | |
| Oceanographer | Jochen Klinke | SIO | |
| Oceanographer | Marguerite Blum | MBARI | |
| Oceanographer | Asila Ghoul | MBARI | |

David Starr Jordan LegII:

| Position | Name | Affiliation | Berth |
|-------------------|---------------------|-------------|-------|
| Chief Scientist | Dave Griffith | SWFSC | |
| Fishery Biologist | Ron Dotson | SWFSC | |
| Fishery Biologist | Dimitry Abramenkoff | SWFSC | |
| Biologist | Noelle Bowlin | AF | |
| Oceanographer | Marguerite Blum | MBARI | |
| Oceanographer | Asila Ghoul | MBARI | |